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Wind characteristic in the wind corridor in Southern Pakistan, the effect of the monsoon

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Any help is welcome in Pakistan's perpetual electricity shortage. The daily shortfall is an estimated 4,000-5,000MW, with a peak demand of 17,500MW during the summer. Resultant load shedding (blackouts) severely hampers business, industry and agriculture. However the country has vast potential for wind power production, about 50,000 MW of electricity on the 65km-long Gharo-Keti Bandar Wind Corridor in the southern part of Pakistan.

A number of meteorological masts have been documenting the wind conditions for several years as background for potential development of wind farms in this area. The meteorological conditions are controlled by the monsoon, and therefore exhibit a considerable annual variability. Here we present an analysis of observations from meteorological masts in the wind corridor. First of all the measurements reveal very generous conditions for harvesting of wind energy; wind energy depends not only on the mean wind but also on the variability of the wind. Often the Weibull distribution is use describe the variability - in terms of the scale (A) and shape parameter (k). The measurements reveal a strong seasonality in both the scale and shape parameter. During the monsoon period both the scale and the shape parameter are large as compared to mid-latitude (European) conditions, indicating a high mean wind but with a narrow distribution. The effect can likely be attributed to the monsoon. We discuss the wind conditions in terms of the annual variability of the wind speed as well as the parameters in the Weibull distribution.